US009427371B1

(12) **United States Patent**
Lamar

(10) **Patent No.: US 9,427,371 B1**
(45) **Date of Patent: Aug. 30, 2016**

(54) **RECLINING TRACTION CHAIR**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 325 days.

(21) Appl. No.: **13/161,264**

(22) Filed: **Jun. 15, 2011**

(51) **Int. Cl.**
A61H 1/02 (2006.01)

(52) **U.S. Cl.**
CPC ***A61H 1/0218*** (2013.01)

(58) **Field of Classification Search**
USPC 602/32–36, 38–40; 482/10, 62, 69; 128/845–847; 5/621–624, 635, 647; 606/241–242, 237
See application file for complete search history.

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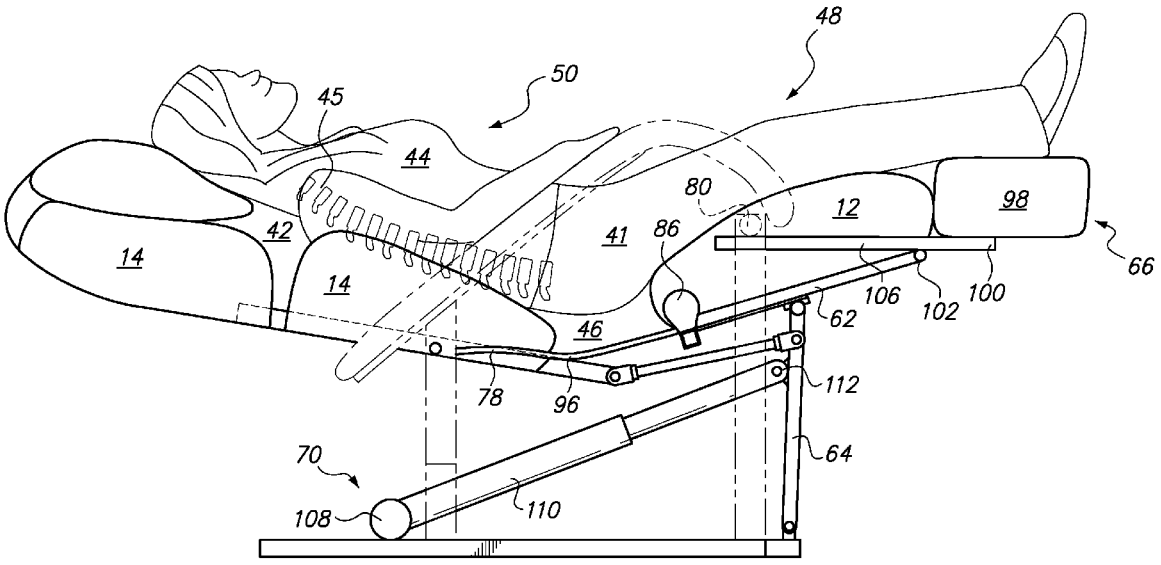
Primary Examiner — Ophelia A Hawthorne

(57) **ABSTRACT**

A traction chair is disclosed which functions as a normal chair when not in use, but which can be deployed to provide a user with traction for decompressing the spine. The traction chair employs a stationary framework that is supported on the ground. A number of articulating components are mounted on the stationary framework; the articulating components being actuated by a motive force. The articulating components when actuated together cause the seat portion of the chair to separate from the backrest portion and open up a widening gap between the seat portion and backrest portion of the chair.

10 Claims, 13 Drawing Sheets



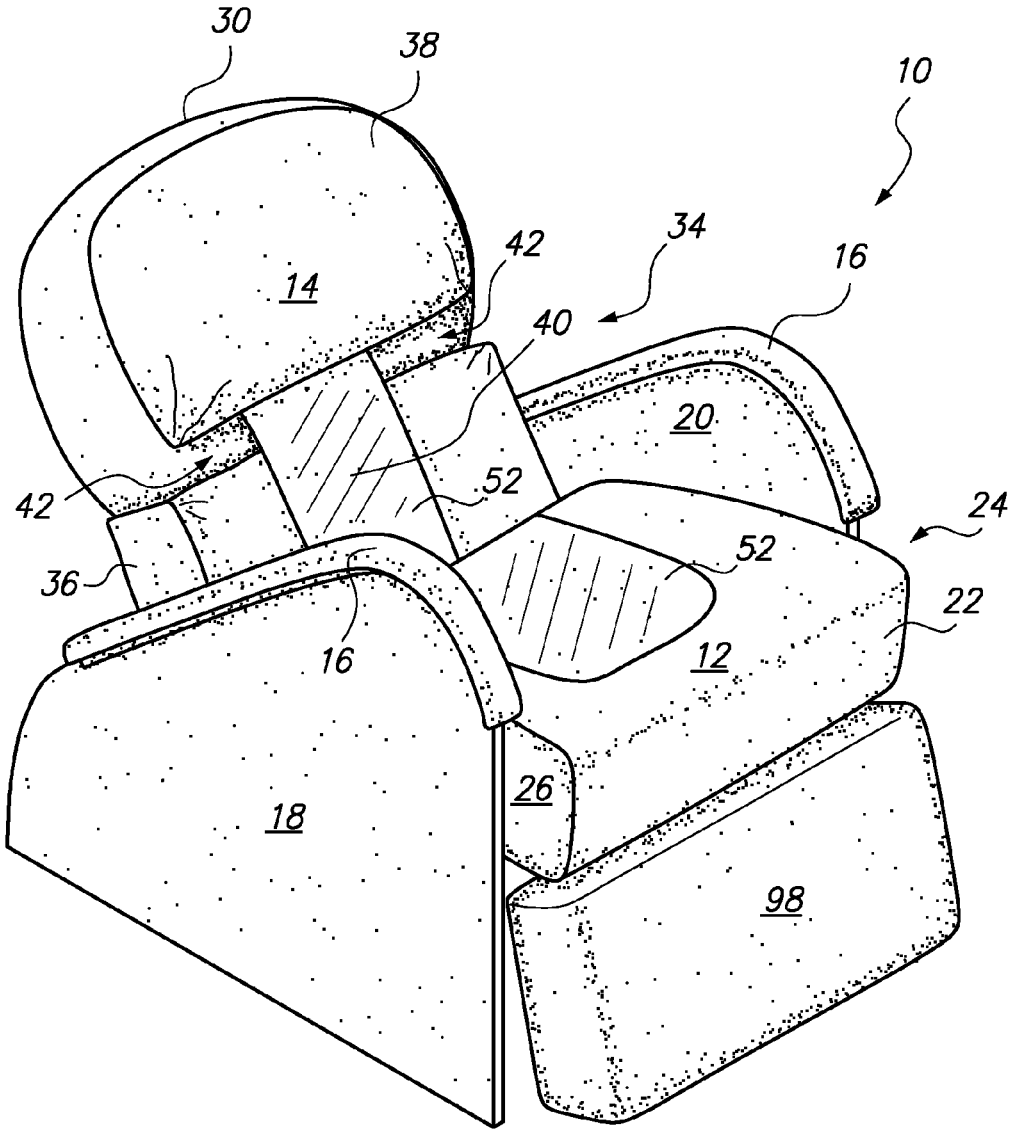


FIG. 1

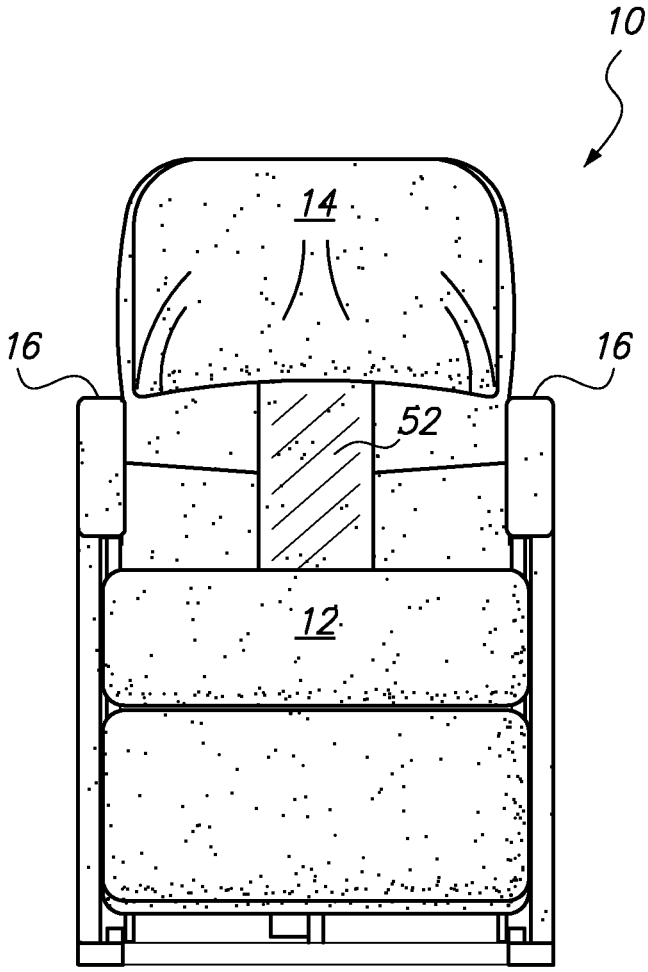


FIG. 2

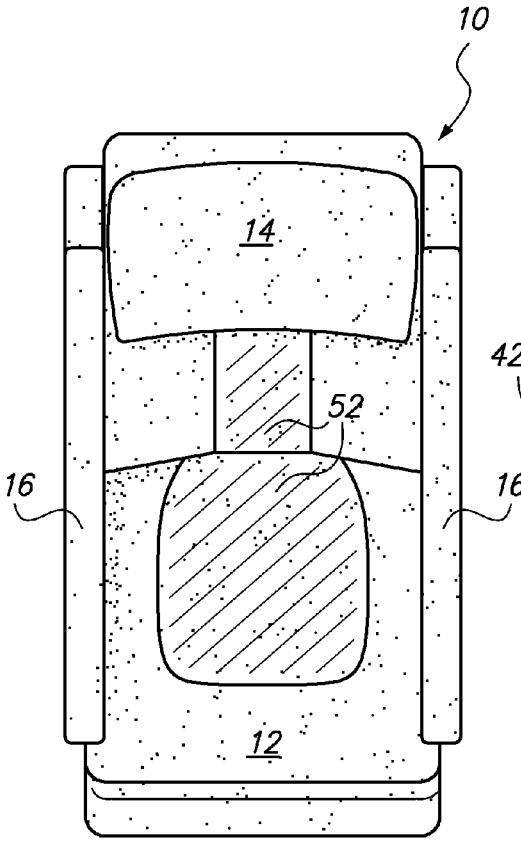


FIG. 3A

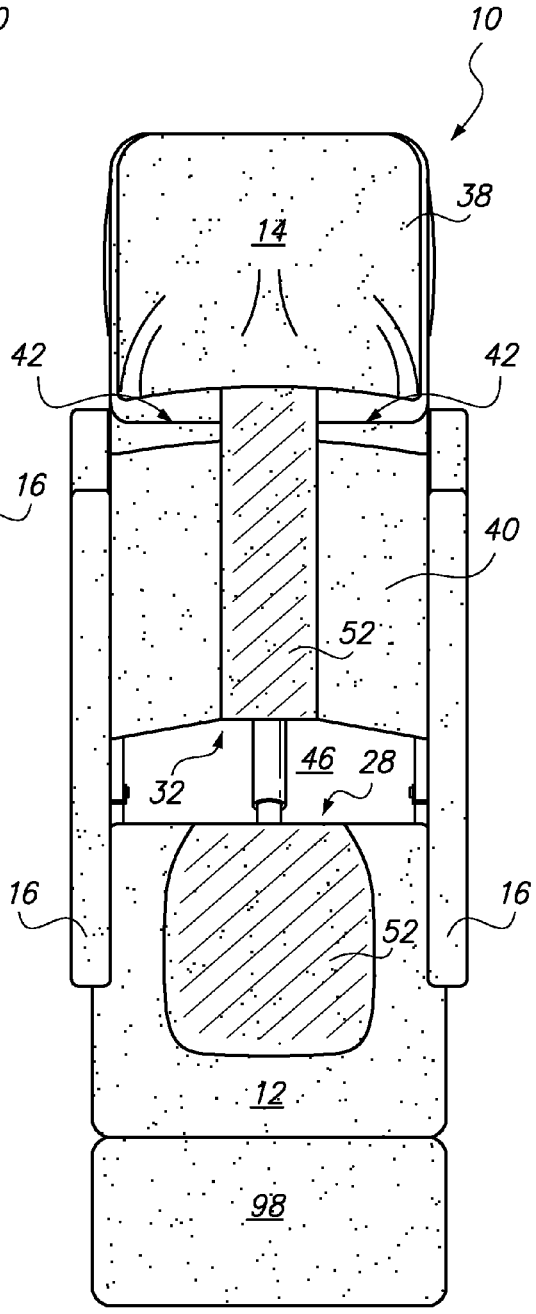


FIG. 3B

FIG. 4

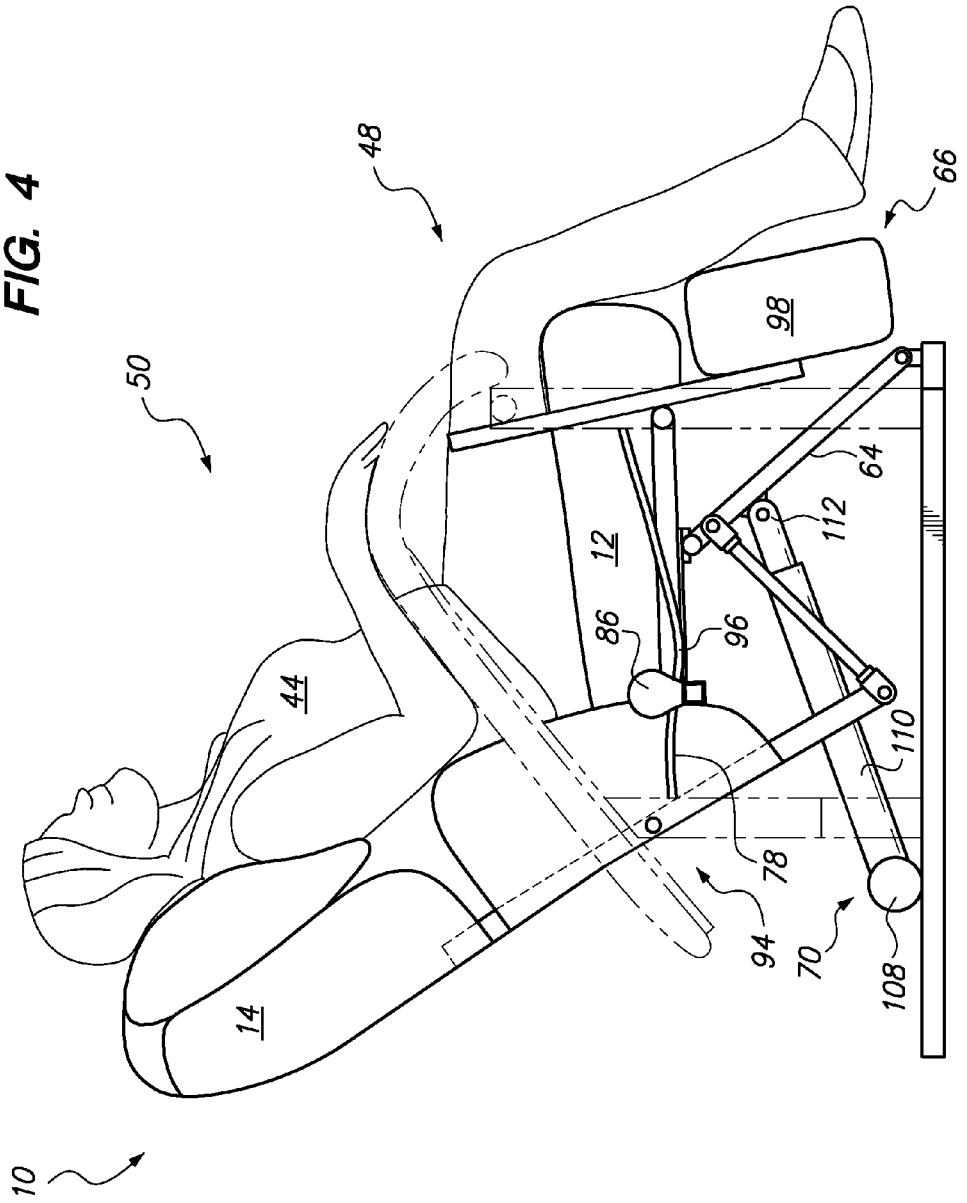


FIG. 5

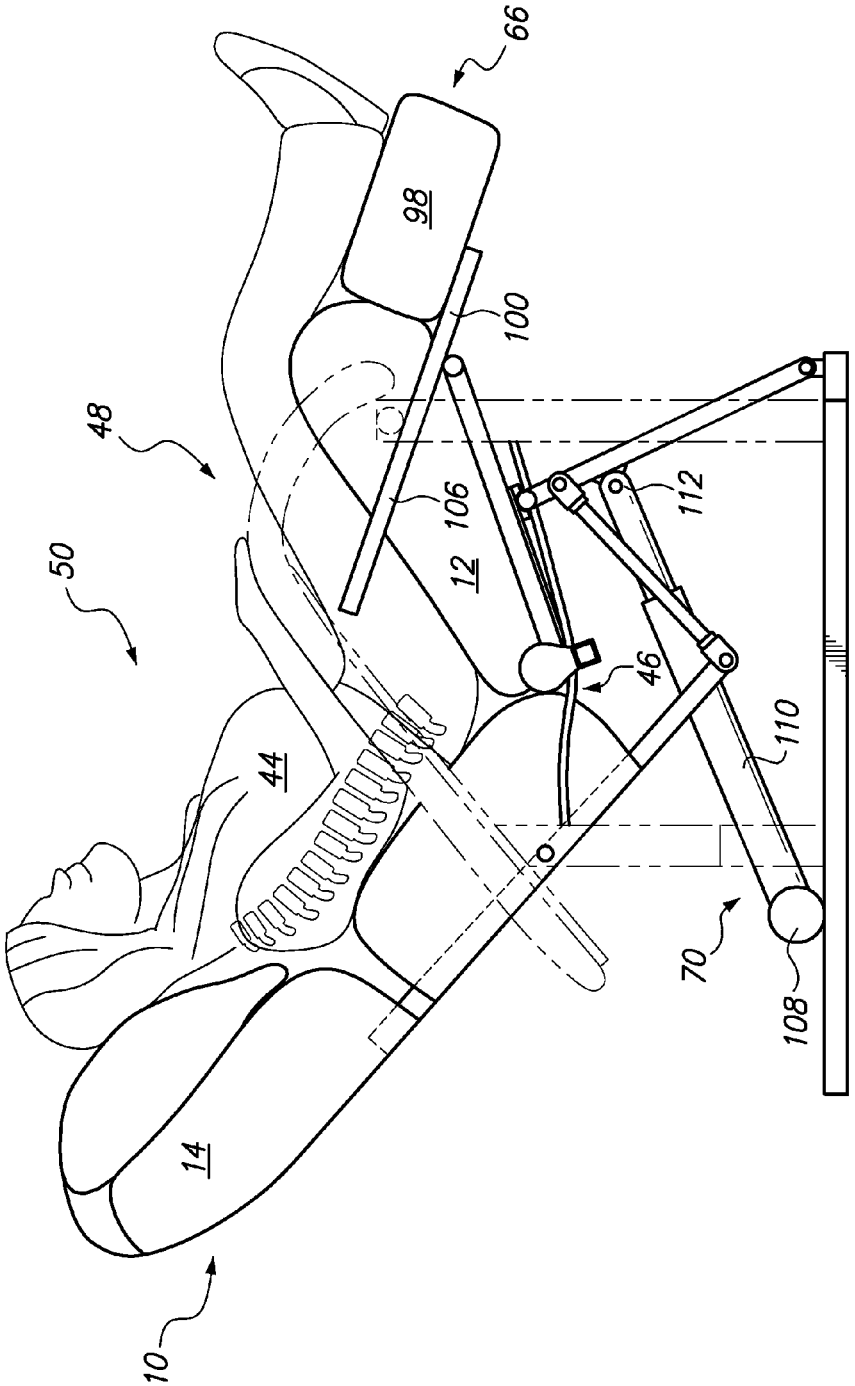
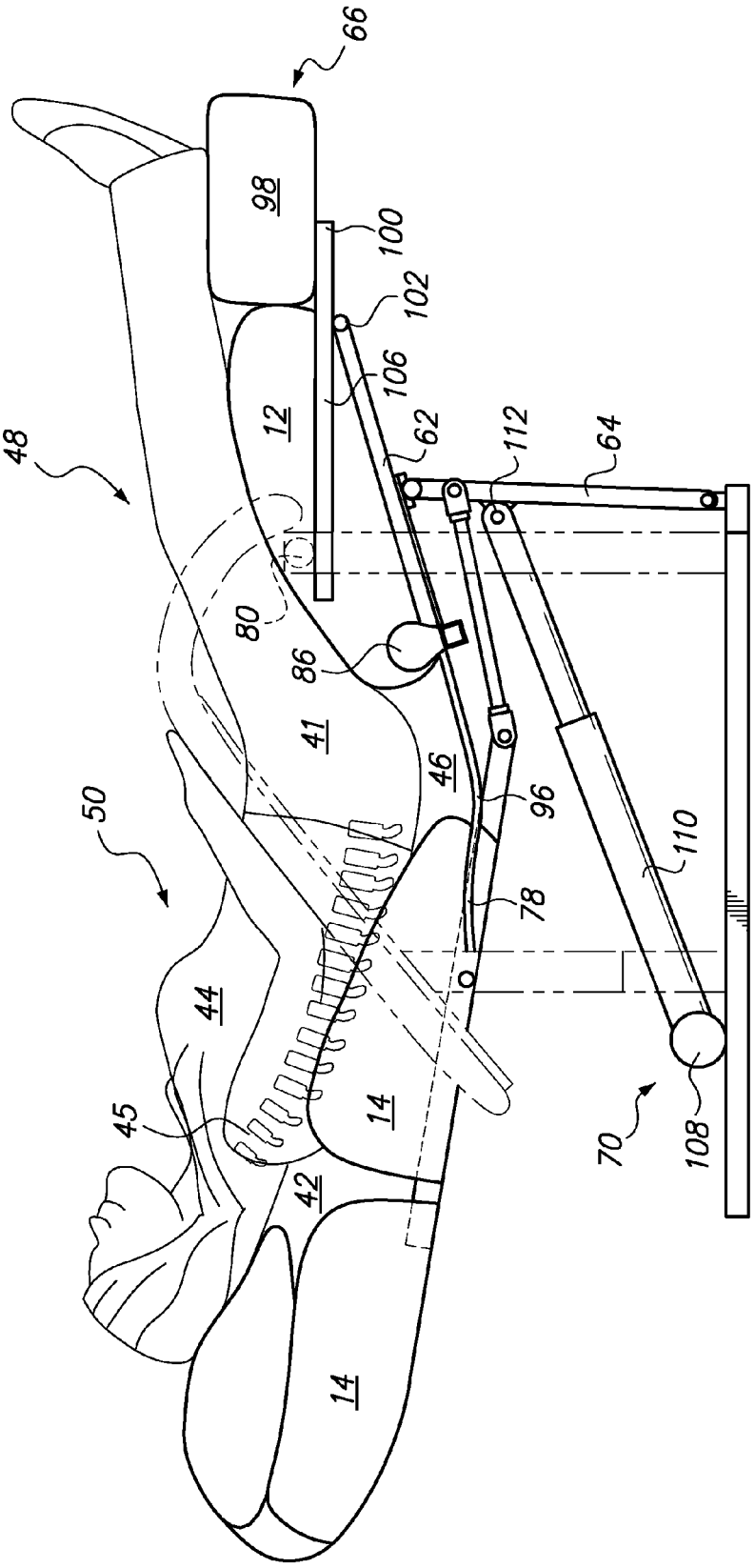


FIG. 6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98
100
102
106
12
62
112
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96
110
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44
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14
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108
14

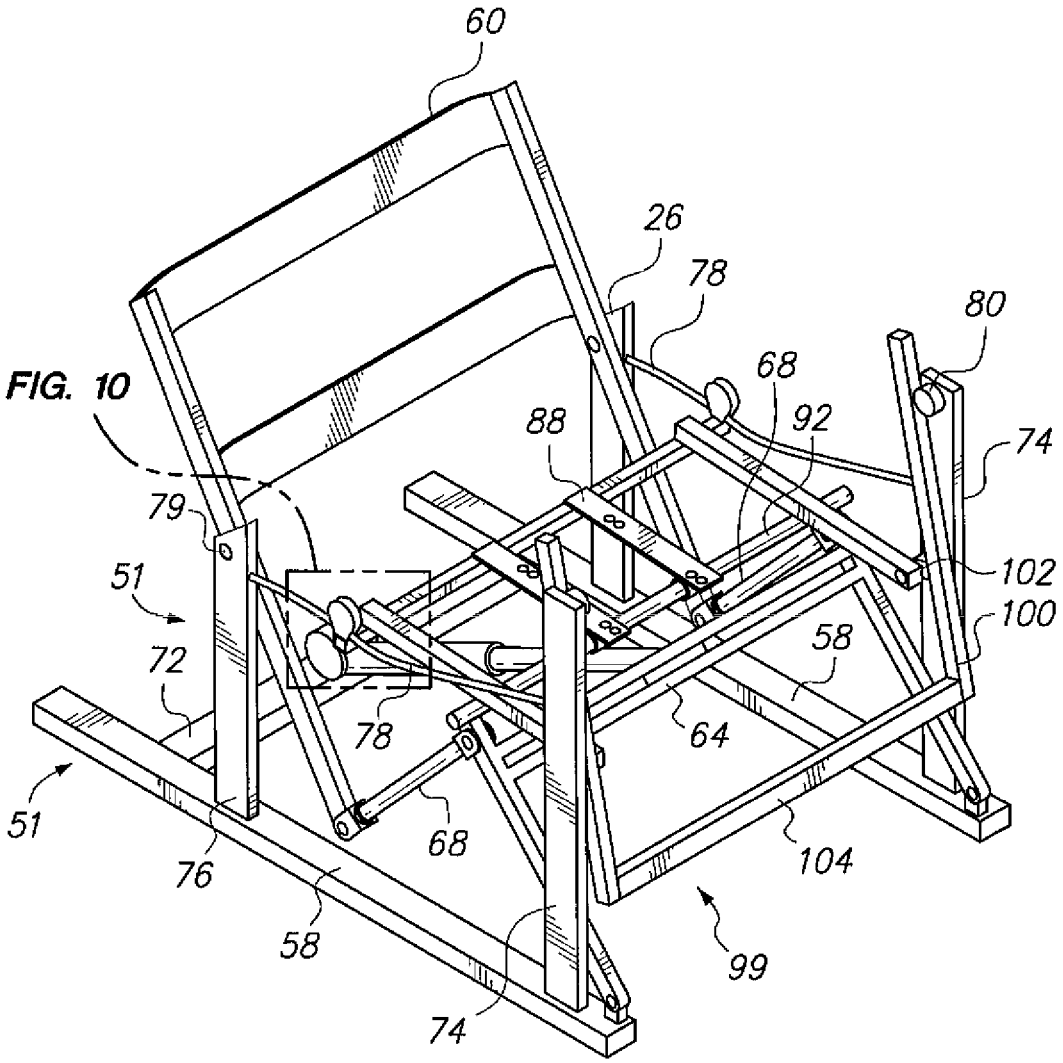


FIG. 10
60
26
78
80
68
92
88
74
79
102
51
100
72
58
78
64
51
68
104
76
58
99
74

FIG. 7

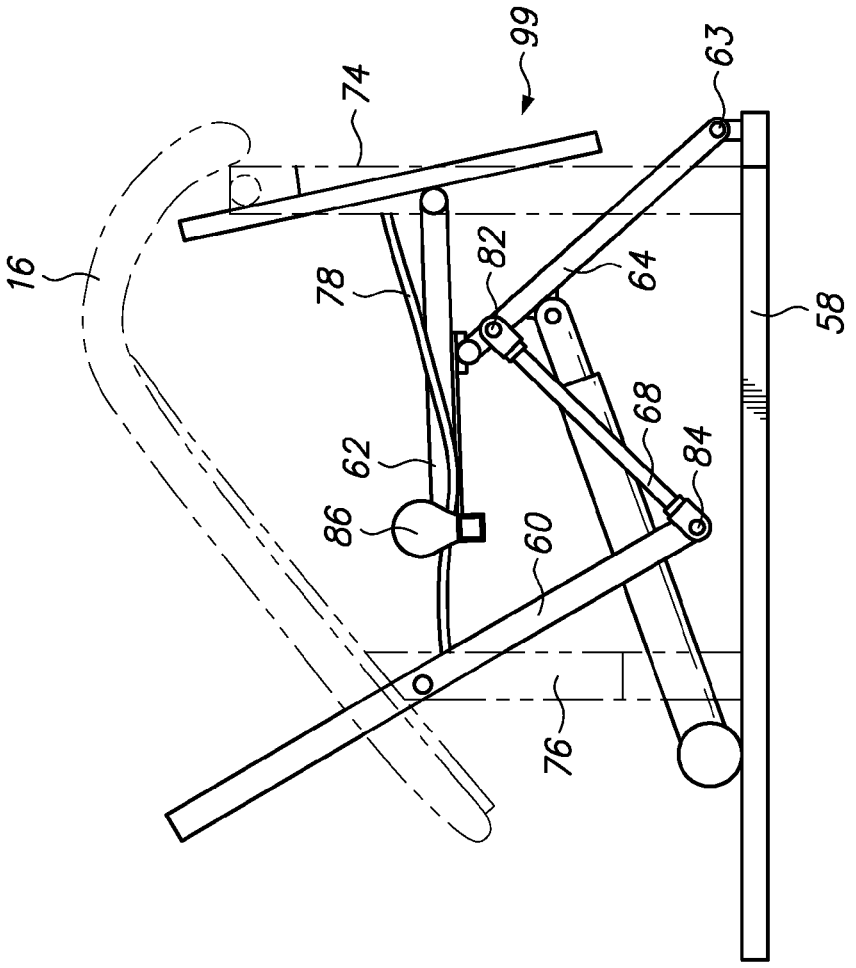


FIG. 8A

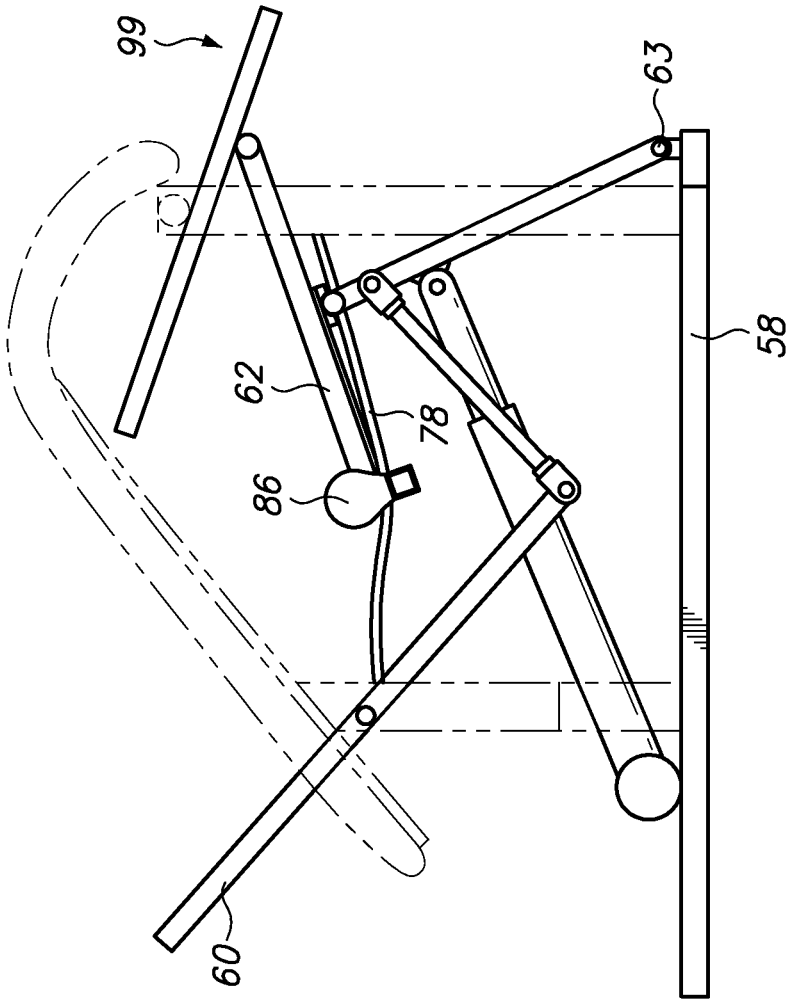


FIG. 8B

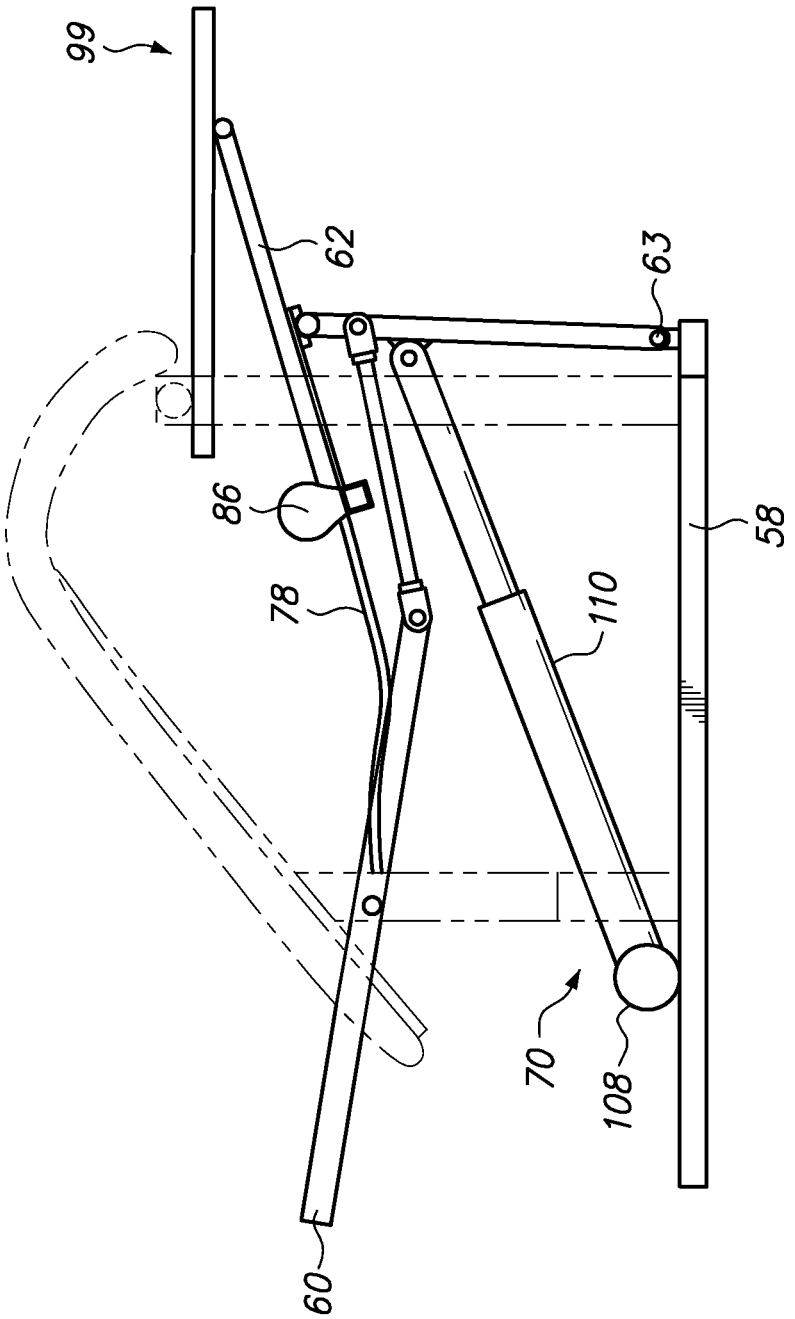


FIG. 8C

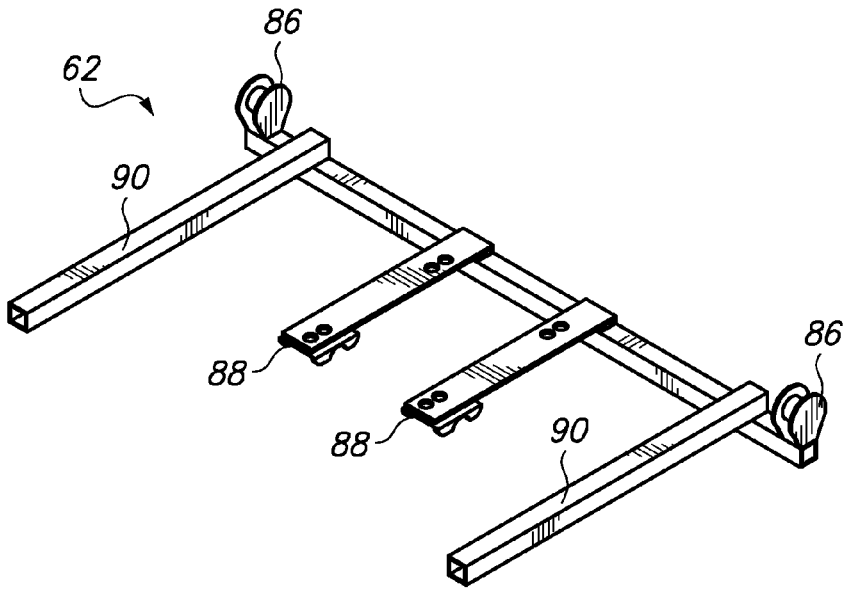


FIG. 9

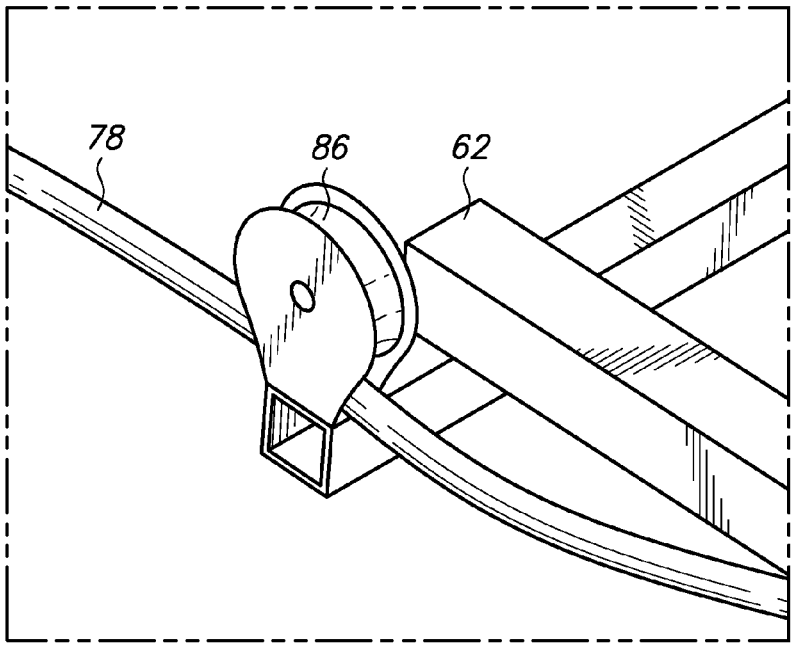
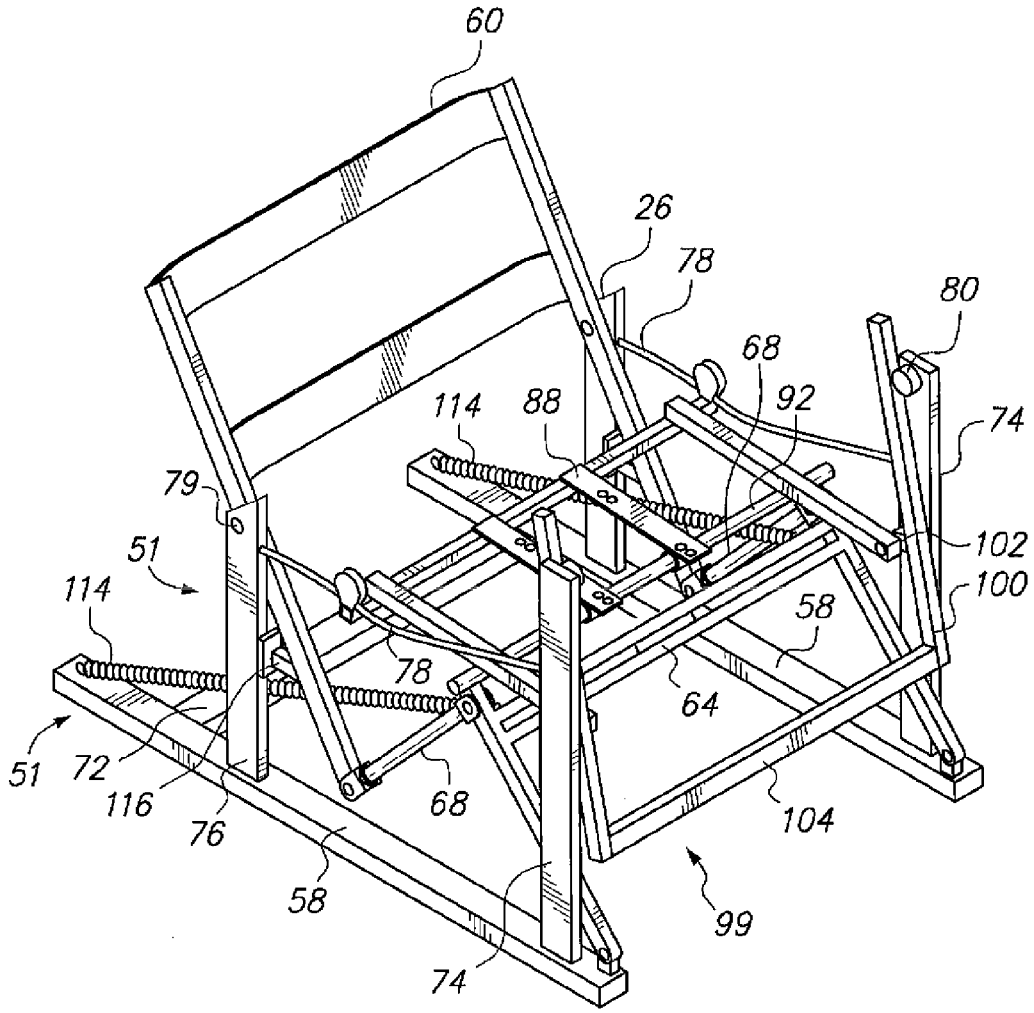


FIG. 10


60
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92
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114
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51
100
114
58
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64
51
72
116
76
68
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58
99
74

FIG. 11

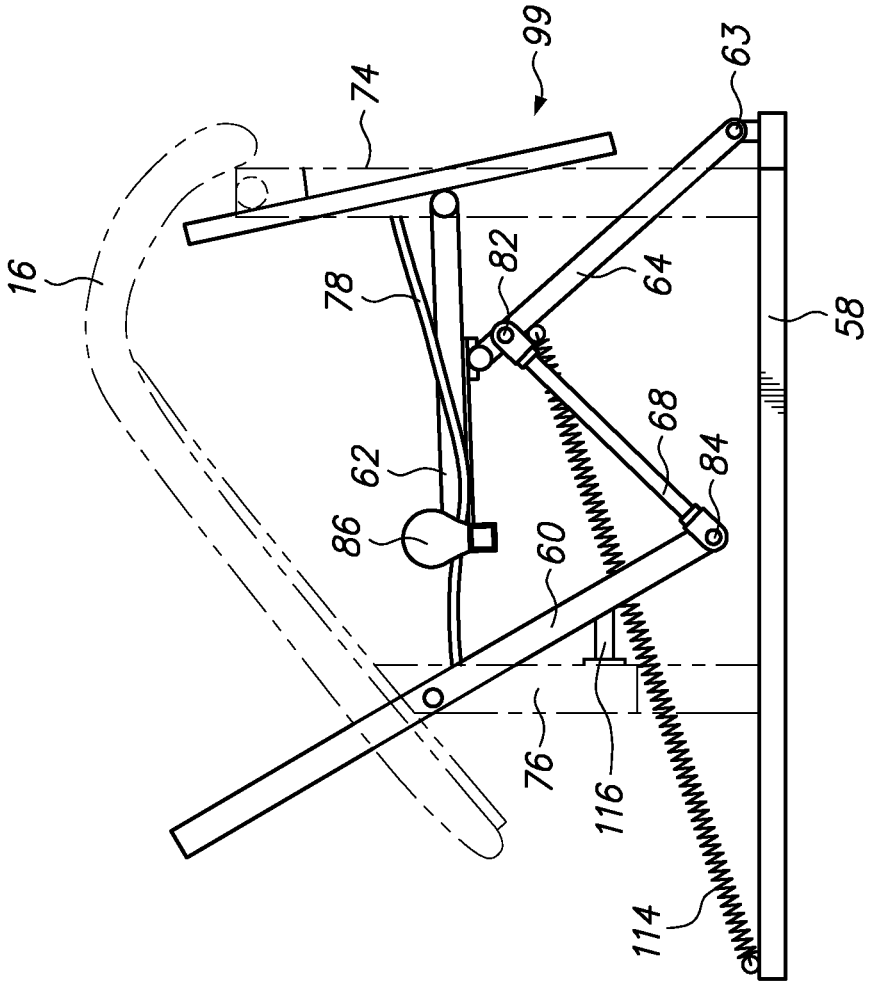

FIG. 12

RECLINING TRACTION CHAIR

BACKGROUND

1. Related Applications

Not Applicable

2. Technical Field

This invention relates to devices which provide a traction force to the human body and more particularly to a reclining traction chair.

Some of the main causes of compression to the human spine include everyday gravitational forces upon the human body, poor posture and poor muscle-skeletal alignment. Spinal compression can manifest itself as minor back pain, but can also progress to nerve damage in more serious cases. Therefore, it has been found to be beneficial to decompress the spine. Decompression allows the spine to relax and realign properly and also to relax and rehydrate the spinal discs located between vertebrae.

A number of methods of decompression involve devices which provide traction to the spine. Traction is the deliberate and prolonged pulling of a muscle or body part to correct dislocation, cause realignment and relieve pressure. Classic traction appliances include the various inversion-type devices which involve inverting the body so that the feet are held fast and the remainder of the body is decompressed through gravity. These devices included inversion boots or inversion tables. A major problem with inversion is that it causes blood to rush toward the head and pool in the upper extremities. People who have heart disease, high blood pressure, eye diseases (such as glaucoma), or are pregnant are at higher risk for complications from inversion therapy and should consult their doctors first to be informed of the risks or else avoid inversion therapy altogether.

Other traction devices for relieving pressure on the spine have come in the form of appliances which immobilize the neck and then apply traction force to the body. U.S. Pat. No. 6,626,494 (Yoo) discloses a traction chair which has a fixture for holding the neck and head immovable while the rest of the body is gradually lowered when the chair is lowered, and a type of gravity traction is applied.

U.S. Pat. No. 4,144,880 (Daniels) discloses a traction table. FIG. **3** of this patent shows a patient with his head and feet immobilized in a harness while the patient's lumbar area is suspended in a gap located between upper and lower table platforms.

U.S. Pat. No. 5,330,254 (Larson) discloses a workplace chair which has a separation gap between the chair back and chair seat upon which a seated worker can suspend the lumbar area of the spine through gravity (See FIG. 7). However, this chair has no method of preventing the upper body from dropping further into the gap from gravity; thus presumably the user would have to constantly readjust as the lumber region becomes uncomfortably jammed into the gap. This patent also suggests further impractical seating positions for a worker (See FIG. 8).

U.S. Pat. No. 6,203,107 (Jonsson) discloses a chair having a separated chair back and chair seat which creates a gap (See FIGS. 8 and 9). This chair has a weight bearing platform on the back portion of the seat, which flexes downward when a person sits in this chair, thus allowing the lumbar area to suspend and decompress, while at the same time providing some support to the seated person's lower body.

The previously mentioned art for relaxing the human spine ranges from medical traction tables to exercise apparatus to office furniture that is of questionable utility. A need exists for a practical and comfortable home traction chair which is attractive in appearance and which provides traction to the spine while a person is relaxing during normal home activities such as watching TV or reading.

The foregoing reflects the state of the art of which the inventor is aware, and is tendered with a view toward discharging the inventor's acknowledged duty of candor, which may be pertinent to the patentability of the present invention. It is respectfully stipulated, however, that the foregoing discussion does not teach or render obvious, singly or when considered in combination, the inventor's claimed invention.

SUMMARY OF THE INVENTION

The invention is a traction chair that is easily integrated as a piece of household furniture, and that provides traction relief to a person seated therein. The traction chair is comprised of a seat back and a seat portion, wherein the seat back and seat portion can be articulated so as to open up a gap between them. The user seats himself in the chair and then articulates the chair so that the gap opens beneath the vertical line of the user's spine, causing the weight of the lower body to suspend slightly into the gap, thus creating traction by gravity. In the preferred embodiment, the traction chair has a frictional material located on the top surface of the seat and on the front surface of the back rest. The frictional material grips the clothing or skin of the seated user and allows for mechanical traction to be applied to the user's body; essentially allowing the lower body to be pulled away from the upper body, thus increasing the tractive force upon the spine beyond that applied by gravitational traction alone.

The inventive traction chair is also functional as a piece of household furniture that provides a level of comfort and practicality for every-day use. The traction chair can be used during relaxation activities such as TV watching and reading, thus allowing a user to obtain the benefits of traction without having to use inversion techniques or traction tables. The traction chair can be used as a recliner, for example, but if traction is desired, then the user can engage the articulation of the seat and backrest so as to apply tractive force to the seated user.

Accordingly, the following objects and advantages of the invention apply:

It is an object of this invention to provide a traction chair that is a comfortable and practical every day option when compared to other traction appliances.

It is another object of this invention to provide a traction chair which can also be used as an attractive piece of household furniture.

Further objects and advantages of the invention will be brought out in the following portions of the specification, wherein the detailed description is for the purpose of fully disclosing the preferred embodiments of the invention, without placing limitations thereon.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be more fully understood by reference to the following drawings which are for illustrative purposes only:

FIG. **1** is a perspective view of the inventive traction chair.

FIG. **2** is a front view of the inventive traction chair.

FIG. **3**A is a plan view of the inventive traction chair in its non-deployed state.

FIG. **3**B is a plan view of the inventive traction chair in its deployed state, showing the gap located between the seat and backrest.

FIG. **4** is a side view of the inventive chair with an armrest shown in phantom so that the user's body position can be viewed; this view shows the user's body position with the chair at rest prior to actuating its tractive capabilities.

FIG. **5** is a side view of the inventive chair with an armrest shown in phantom so that the user's body position can be viewed; this view shows the user's body position cradled within the backrest and seat upon actuating the chair's tractive capabilities.

FIG. **6** is a side view of the inventive chair as shown in FIG. **5**, with the backrest and seat separated at their maximum deployment.

FIG. **7** is a front perspective view of the framework and articulating components of the inventive chair with the padded backrest and seat removed.

FIG. **8**A is a side perspective view of the framework and articulating components of the inventive traction chair shown in a non-deployed state.

FIG. **8**B is a side perspective view of the framework and articulating components of the inventive traction chair shown in a partially-deployed state.

FIG. **8**C is a side perspective view of the framework and articulating components of the inventive traction chair shown in a fully-deployed state.

FIG. **9** is a perspective view of the seat carriage of the inventive traction chair.

FIG. **10** is a close up elevated perspective view of the seat carriage attached to the carriage rails.

FIG. **11** is a perspective view of a manual embodiment of the inventive traction chair.

FIG. **12** is a side view of the manual embodiment of FIG. **11**.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The inventive reclining traction chair **10** is shown in FIGS. **1**-**3**A, **3**B which has the appearance of a typical "recliner" and could be used as such. The chair **10** has a padded seat **12**, a padded backrest **14**, padded armrests **16** located on either side **18**, **20** of the padded seat and a padded footrest **98**. The padded seat **12** has a front side **22**, left and right sides **24**, **26** and a rear side **28**. The padded backrest **14** includes a top **30**, bottom **32** and left and right sides **34**, **36**, a head pad **38** and a back pad **40**; near the sides **34**, **36** of the backrest **14**. Between the head pad **38** and back pad **40** are gaps **42** to allow the shoulders space to fall into during traction. By relieving pressure on the shoulders, the chest of a user opens up and relaxes during traction.

FIG. **4** shows a side view of the chair **10** with a user **44** seated therein and using the chair **10** in normal fashion. In FIG. **5**, the user **44** has decided to actuate the traction capabilities of the chair **10** and as shown, the backrest **14** and seat **12** begin to separate to form a gap **46**, while at the same time the backrest **14** tilts backward and the seat **12** travels forward and tilts upward as shown. In FIG. **6**, the backrest **14** and seat **12** have reached their maximum range of travel and the user's buttocks **41** are located in the gap **46**. In FIGS. **5** and **6**, the user **44** is cradled in a tilted orientation in the chair, so that the user's weight is born in the chair cradle. When the gap **46** is widened, the user's sacral region and hips sink partially into the gap. This creates a gravitational traction on the spine which helps the spine's initial relaxation to occur. Also, relaxation of the shoulders **45** is aided by gaps **42** in backrest **14** which allow the shoulders **45** to fall by gravity, especially in the orientation shown in FIG. **6**. When shoulders **45** fall into gaps **42**, the chest opens up and causes further relaxation.

As the gap **46** is opened wider, the mechanical tractive force of the chair **10** further causes the lower body **48** (located in the seat) to be pulled in a direction opposite from the upper body **50** (located against the backrest). Separation is aided by a frictional material **52** covering the body-facing surfaces of both the seat **12** and the backrest **14**. This frictional material **52** grips a user's clothing as the gap **46** is widened, thus maintaining the user's lower body **48** in the seat as immobile as possible and further maintaining the user's upper body **50** as immobile as possible against the backrest **14**. The frictional material **52** operates on a similar principal as neck harnesses, cables, or head retaining appliances often seen used with traction tables; that is, to maintain body parts as immobile as possible so that as traction is applied, the lower body **48** and upper body **50** are pulled in opposite directions, thus opening up the spine and relieving pressure thereon. The inventor has found that material used on motorcycle seats provides an exemplary frictional material which suffices for the purposes of the invention.

FIG. **7** shows the framework and articulating components of the inventive traction chair **10** which underlies the padded seat **12**, backrest **14** and footrest **98**. As shown, a central stationary framework **51** provides a foundation upon which are hung the articulating components of the chair **10**. The articulating components are comprised of all the components which move upon actuating the chair **10**. These include the backrest framework **60**, the seat carriage **62**, front seat carriage support **64**, footrest assembly **66**, connecting rods **68** and electronic telescoping actuator **70**.

Framework **51** is comprised of a base which includes left and right side foot members **58** which are connected by cross beam **72** and four vertical members, two in front **74** and two in the rear **76**. Cross beam **72** includes a mounting plate (not shown) for the electronic telescoping actuator **70** which will be discussed in more detail later herein. Referring also to FIG. **8**A, left and right armrests **16** are connected to the central stationary framework by vertical members. Left and right guide rails **78** connect front and rear vertical members **74**, **76** and guide rails **78** are mounted parallel with left and right armrests **16**. At the uppermost points of left and right front vertical members **74** are mounted rollers **80** which face each other on the inside of vertical members **74**.

FIGS. **8**A-**8**C illustrate the graduated movement of the articulating components as the chair is articulated from a resting position (FIG. **8**A), to a middle position (FIG. **8**B), to a fully deployed position (FIG. **8**C). The articulation is achieved by the movement of actuator **70** coupled with the connection of the articulating components which transfer the force from the actuator **70** throughout the various components. By illustration, the connecting rods **68** connect the backrest framework **60** to the seat carriage support **64** and in turn backrest framework is pivotally connected **79** to rear vertical members **76**. Connecting rods **68** have a first end **82** which pivotally connects to the top of the seat carriage support **64** and a corresponding second end **84** which pivotally connects to a bottom end of the backrest framework **60**. Connecting rods **68** provide a linkage connecting backrest framework **60**, seat carriage support **64** and seat carriage **62**, thus allowing them to articulate in a simultaneously coordinated fashion.

Seat carriage **62** travels horizontally forward and back on left and right guide rails **78**; when traveling in its forward horizontal direction, the seat carriage **62** separates seat **12** from the backrest **14**, thus opening up the gap **46** between the seat and backrest as discussed above. As further shown in FIG. **9**, seat carriage **62** is essentially a framework, laid horizontally, which supports the seat. A pair of rollers **86** is

attached to seat carriage **62** in an outboard fashion, which allows them to engage with left and right guide rails **78**, the rollers **86** being spaced to fit over guide rails **78** and travel evenly upon them. A seat carriage support mounting bracket **88** is located in the center of seat carriage **62**. Mounting bracket **88** attaches to cross tube **92** of front seat carriage support **64**. Left and right side rails **90** of seat carriage **62** extend substantially forward of mounting bracket **88**.

FIG. **10** shows the seat carriage **62** mated with the guide rails **78**. When rollers **86** are mated to guide rails **78**, they provide a weight-bearing support for the rear of the seat carriage **62**. The seat carriage support **64** is pivotally connected **63** to foot members **58** which provides a more forward-positioned weight bearing support for the seat carriage **62** (See FIGS. **8**A-**8**C).

As shown in FIGS. **8**A-**8**C, as seat carriage **62** travels upon the left and right guide rails **78** the orientation of seat carriage shifts as the seat carriage travels along the contours imparted into left and right guide rails. Guide rails are contoured with an upward angle as they extend to the front of the chair **10**. As the seat carriage travels forward, the upward slope of the guide rails **78** causes the seat **12** to angle upward. This action tends to lift the user's feet off of the ground causing the user **44** to be cradled by the seat **12** and backrest **14** as shown in FIG. **6**. This suspension of the user's body off the ground causes the user's weight to sink into the gap **46**. Toward the rear **94** of the chair **10**, guide rails **78** adopt a severe concave bend **96** which, when the seat **12** travels backward, causes rollers **86** to dip into the bend **96**, which causes the seat **12** to angle downward, to a level orientation (See FIG. **4**). At this point the user is again sitting upright and his feet are flat on the ground as shown in FIG. **4** and the gap **46** between seat and backrest is nonexistent. The traction chair **10** can then be used as any normal chair in this orientation.

The inventive traction chair **10** has a footrest assembly **66** that is deployed when the chair is in its maximum traction orientation as shown in FIG. **6**. The footrest assembly **66** is designed to actuate into a deployed position as the seat carriage moves to its forward positioning. Footrest assembly **66** is comprised of a frame **99** attached to a footrest cushion **98**. Frame **99** has two rearward-extending side rails **100** joined by cross-member **104**. Side rails **100** are pivotally attached to the front of seat carriage **62** at pivotal attachment points **102**. A length of side rails **106** extend rearward of the attachment points **102**. The rearward extension of side rails engages rollers **80** attached near the top of front vertical member **74**. As seat carriage **62** travels forward it forces the rearward extensions **106** against rollers **80**, causing the footrest assembly **66** to rise to a deployed position (See FIGS. **4**-**6**); when the seat carriage **62** travels in reverse, the footrest assembly **66** falls until it reaches a stowed position.

The actuator **70** is preferably comprised of an electric motor **108** attached to a telescoping shaft **110**. In FIGS. **4**-**6**, the chair is shown with the telescoping shaft **110** traveling from minimal to maximum deployment. The electric motor **108** attaches to motor mount (not shown) on cross beam **72**. The telescoping shaft **110** has a first end which connects at pivotal attachment point **112** to the front seat carriage support **64**. The second end of the shaft **110** connects to the electric motor **108**. The electric motor **108** can be selectively actuated in a forward and reverse direction. The forward direction places force on the front seat carriage support **64** and causes the seat **12** to travel forward in the manner previously described. The remaining articulating components also operate as described herein. When the forwardmost extension of telescoping shaft **110** is reached (See FIG. **6**), the widest gap **46** between seat **12** and backrest **14** is also achieved; however a user may actuate the motor to whatever point feels most comfortable and which decompresses the spine.

Manual methods of actuation are also contemplated in the invention. For example, although not shown in the drawings, a manual actuating handle could be used as a means for supplying motive force (in place of actuator **70**) to the articulating components of the traction chair. The handle would be operated by the user's muscle force, and force could be applied by the user against the front seat carriage support **64** through a linkage attached to the handle. The handle could be engineered to have several "stops" so that the user could selectively actuate the chair to achieve different sizings of gap **46** which most comfortably fit the user and decompress the spine.

FIGS. **11** and **12** propose a second manual means for actuating the chair. In this embodiment, a pair of springs **114** are attached to foot members **58** at their first ends and further attached to seat carriage support **64** at their second ends. The user **44** would seat herself in the chair **10** and push down and forward on arm rests **16**, and lean back against backrest **14**, thus manually causing seat **12** to move forward on guide rails **78** and cause gap **46** to open up. At maximum extension of springs **114**, the maximum gap **46** would be opened. A stop or lockout position could be engineered by means well known in the art when the maximum extension is reached, thereby allowing the user to relax from applying manual force upon armrests **16**. When it is desired to retract the chair, the user **44** would grasp armrests **16** and apply downward force on footrest assembly, thereby overcoming the lockout position and forcing the seat **12** to travel rearward, thereby causing the chair **10** to return to its retracted position as shown in FIG. **1**. Stop **116** would prevent any further rearward travel of backrest **14** once the chair **10** returns to its retracted position.

Finally, although the description above contains much specificity, this should not be construed as limiting the scope of the invention, but as merely providing illustrations of some of the presently preferred embodiments of this invention. This invention may be altered and rearranged in numerous ways by one skilled in the art without departing from the coverage of any patent claims, which are supported by this specification.

The invention claimed is:

1. A traction chair apparatus, comprising:

a backrest;

a seat, said seat having a front side and a rear side, wherein said rear side of said seat contacts said backrest when said seat is in a retracted position;

articulating components articulating said seat in a forwardly direction to achieve a separation of said rear side of said seat from said backrest to open up a gap between said rear side of said seat and said backrest;

said articulating components articulating said seat in a further forwardly direction causing widening of said gap between said rear side of said seat and said backrest and applying traction to a user seated in said traction chair apparatus;

said articulating components continuing to articulate said seat in a forwardly direction to achieve even further widening of said gap between said rear side of said seat and said backrest into a fully deployed position;

said seat articulating in a forwardly direction being oriented into an upwardly tilted attitude during travel in a forwardly direction.

2. The traction chair apparatus as recited in claim **1**, further comprising an actuator, said actuator transferring

force to said articulating components and articulating said articulating components to a fully deployed position.

3. The traction chair apparatus as recited in claim **2**, wherein said actuator further comprises an electric motor attached to a telescoping shaft.

4. The traction chair apparatus as recited in claim **2**, wherein said actuator is a manual actuator.

5. The traction chair apparatus as recited in claim **1**, wherein one of said articulating components comprises a seat carriage, said seat carriage being attached to said seat, said seat carriage allowing the travel of said seat in a forwardly direction causing complete separation of said backrest from said rear side of said seat to open a gap between said backrest and said rear side of said seat.

6. The traction chair apparatus as recited in claim **5**, further comprising left and right guide rails, said seat carriage further comprising left and right rollers, said rollers traveling upon said left and right guide rails.

7. A traction chair apparatus, comprising:

A backrest;

a seat, said seat having a front side and a rear side, wherein said rear side of said seat contacts said backrest at a first position;

means for articulating said seat in a forwardly direction, said means for articulating said seat in a forwardly direction causing complete separation of said backrest from said rear side of said seat to open a gap between said backrest and said rear side of said seat at a second position, said seat being disposed into an upwardly tilted attitude while articulating in a forwardly direction;

said gap being sufficient for allowing at least a sacral region of a user to descend into said gap.

8. The traction chair apparatus as recited in claim **7**, further comprising a frictional material covering a body-facing surface of said backrest and said seat.

9. The traction chair apparatus as recited in claim **8**, further comprising an electronic actuator, said electronic actuator causing articulation of said seat and backrest so as to open or close said gap between said backrest and seat.

10. The traction chair apparatus as recited in claim **7**, wherein said backrest further comprises gaps for positioning a user's shoulders.

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